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**From:** Bill Winchester [bwinchester@scec.com]  
**Sent:** 5/1/2013 4:09:57 PM  
**To:** Lapka, Joseph [Lapka.Joseph@epa.gov]  
**CC:** Kelly, Shaheerah [Kelly.Shaheerah@epa.gov]  
**Subject:** RE: Municipal Waste Incineration Units  
**Attachments:** ATT00001.txt

**Importance:** High

Mr. Lapka:

I was referred to you by Shaheerah Kelly regarding some questions I had about a previous NSPS applicability determination for a waste to energy gasification operation. My inquiries are related to another proposed system, for which we're seeking an applicability determination:

*The device is technically called a "Fluidized-Bed Staged Gasification" unit. It incorporates a fluidized bed at the bottom of a chamber, where refuse-derived fuel (RDF) is injected and exposed to a hot turbulent environment (1200-1400°F) and sub-stoichiometric conditions (30% of the O<sub>2</sub> required for combustion). The constant abrasive contact of the hot sand with the RDF scrubs the ash from the fuel particles to continually expose a new fuel surface for this "gasification" process. As the RDF is exposed to the fluidized bed media, the heat generated drives off volatile gases and moisture within the fuel (devolatilization), creating a low-btu gas (LBG; typically 150-250 btu/cf). The LBG created in the fluidized bed, flows to the top of the chamber, into a thermal oxidation zone. In the fluidized bed, the remaining carbon, or char, is converted by the fluidizing gases into additional synthesis gas plus heat, which is utilized as the driving force to maintain the reaction. Air is introduced into the thermal oxidation zone as required for the complete combustion of the LBG, and temperatures are typically increased to the 1600-1800°F range. The exhaust gas from this oxidation process, consisting of primarily water vapor, air, carbon dioxide, and non-hazardous ash residue, would then be sent past a waste heat recovery device (i.e., boiler), then through a series of emission control devices before being expelled into the atmosphere from a stack. The waste-heat recovery boiler generates steam, which drives a steam turbine generator that produces about 1 MW of power to be used at the plant itself and another nearby facility.*

Ms. Kelly has given us a preliminary determination that the proposed system would be subject to NSPS Subpart EEEE (because it has a design capacity below the threshold for Subpart AAAA applicability); however, with some clarification on the topics below we would have a better handle on EPA's position when determining applicability for this and other projects.

I have noted a particular applicability determination for Subpart AAAA, from March 30, 2010. Fulcrum BioEnergy, Inc. (c/o Patrick D. Traylor of Hogan and Hartson, LLP) had requested such a determination for its proposed facility in McCarran, NV. The proposed plant was designed to convert post-sorted MSW feedstock into a synthetic gas, which would then be processed to produce ethanol and renewable power. More specifically, a portion of the syngas created in the gasification process would be burned in a combined cycle combustion turbine, with the remaining portion utilized to produce a commodity (ethanol).

In its determination, EPA stated that because the syngas production process was neither combustion nor pyrolysis, it was not considered a "pyrolysis/combustion unit" or "municipal waste combustion unit" as defined in Subpart AAAA. Furthermore, since the combined cycle combustion turbine was burning homogenous waste (i.e., the syngas only), it would be exempted from AAAA provisions as long as the system met the qualifications for a small power production facility or a cogeneration facility. There was also a flare associated with the process to burn any excess syngas, should there be excess production. This portion of the process was also deemed as not subject to Subpart AAAA, because it was air pollution control equipment.

So this raises some questions for me. First, EPA has determined that a gasification process is not necessarily a combustion or pyrolysis process. What distinguished Fulcrum's gasification process from the one we proposed, making

Subpart AAAA non-applicable? Based on the general definition of pyrolysis, it sounds like our proposed process would fall into that category, but please clarify.

Furthermore, in Fulcrum's system, the syngas was burned directly in a combustion turbine to produce power. Our proposed system combusts the gas in a thermal oxidizer, which creates additional heat for a waste-heat recovery boiler driving a steam turbine generator to produce power. Does EPA distinguish between direct and indirect power production processes when it comes to the exemption criteria? Fulcrum's system combusts gas in a turbine, which directly drives a generator. Other examples would be reciprocating internal combustion engines or direct-fired boilers (i.e. those which burn syngas to produce steam). So what drives the EPA's position on this portion of the applicability determination? Or is it the homogenous waste aspect? After all, our proposed system would also be burning the syngas, a homogenous waste stream based on EPA's interpretation, to produce power albeit through indirect means. That said, I have not looked into the criteria for qualification as a small power production facility or cogeneration facility, which is also a factor for exemption for Subpart AAAA.

Finally, if there is no applicable NSPS, either because of applicability criteria or through exemption, then would a Title V permit still be required for the plant? I notice that Section 129 of the CAA specifies that if there is a promulgated NSPS for a particular category of unit, it would need a Title V permit notwithstanding other triggers, like being a major source. In fact, Subpart EEEE explicitly states that a Title V permit is required if it applies to a system. So if our process could be exempted from NSPS AAAA or EEEE, would it still require a Title V permit? Furthermore, would a gasification process which was not considered pyrolysis or combustion even be subject to Section 129?

Are there any other NSPS or NESHAP regulations which would apply to the proposed unit, should it be exempted from AAAA or EEEE?

Thank you very much.

Regards,

**Bill Winchester, CPP**  
Project Manager



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